The Present Status of Intubation in the Treatment of Croup.

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J. O'DWYER, M. D.

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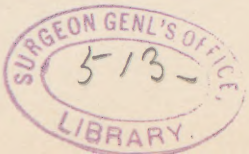
Most difficult would be the task of the impartial reader who would attempt to arrive at any definite conclusion regarding the value of intubation from the most careful study of the literature of this subject, unaided by personal experience. So conflicting are the opinions that have been expressed by the numerous writers on this subject, that the partisan, choosing whichever side his fancy or prejudice might dictate, could produce an array of authorities and statistics in support of his arguments, either *pro* or *con*, that to the inexperienced would appear overwhelming. Jumping at conclusions from a limited experience, the one thing above all others that the practice of medicine should teach us to avoid is the principal cause that has led to the confusion and difference of opinion that still exist on this question. The more fatal a disease, the more caution is necessary in making deductions from the evidence derived from a few cases, because, under these circumstances, the element of chance or coincidence often plays an important



part which is excluded when large numbers are considered. For example, I recently intubated a patient for a physician in my neighborhood, who informed me that it was his eighth case of this kind, and that seven of them had recovered. For another physician, only a few blocks distant, I had intubated a similar number of cases, every one of which died. At the Great Ormond Street Hospital, London, in the year 1890, intubation was first tried in eleven cases of croup with only one recovery. This result was considered sufficiently unfavorable to condemn the operation, and it was therefore abandoned. At the end of two years, owing probably to more favorable reports from other quarters, it was again tried in another series of eleven cases, this time with eight recoveries (*British Medical Journal*, July 22, 1893). Whether only one patient or eight patients out of eleven recover proves absolutely nothing except that some patients do recover after intubation. Neither would it have proved anything had every one of the twenty-two died, except that the mortality following intubation for croup was very large—a fact which no one with sufficient experience disputes. The literature of intubation abounds with similar examples of reaching conclusions from a limited experience, and it is on such evidence that this procedure has been overestimated by some and condemned as useless by others, according to the varying results obtained in a few cases.

The fatal and complex nature of croup, which renders such contradictory results possible under the same method of treatment, is also to some extent responsible for this condition of things.

Acute non-traumatic stenosis of the larynx in children that endangers life by suffocation is, with rare exceptions, diphtheria, either true or false. This disease, if unrelieved by mechanical means, proves fatal in about ninety per cent.

of the cases, and, with all the aid that medicine and surgery can afford, it still continues to be, with few exceptions, the most fatal of all the acute diseases. The much-dreaded Asiatic cholera seldom carries off more than half its victims, while croup claims a much larger percentage. Even some epidemics of cerebro-spinal meningitis are more merciful than this disease, the terrors of which are less apparent because always present.

In considering the causes that lead to such frightful mortality and the unsatisfactory results obtained from any method of treatment yet devised, the important fact is often lost sight sight of that the word croup means a good deal more than obstruction in the larynx. Did it only mean the latter, there would be no room for any difference of opinion as to the best method of treating it, because under these circumstances intubation in skillful hands would have no failures.

Those familiar with the pathology of this disease know that the most frequent cause of death, after the laryngeal stenosis has been overcome by means of intubation or tracheotomy, is the extension of the disease to the bronchial tubes, where surgery can not reach it; and that there are several other causes, such as pneumonia, systemic poisoning, paralysis, especially of the heart, and nephritis, each of which contributes its quota toward swelling the mortality of this terrible disease. It goes without saying that the results of any method of treatment in a disease having so many complications, the fatality of which is so great under all circumstances, and which varies so widely in different epidemics, must be obtained from a large number of cases in order to be of any value. Not even are the results of intubation obtained from a large number of cases collected from numerous operators, each contributing a few, of much value, because the ability to intubate without im-

mediate danger to life can not be acquired by the amount of practice derived from a few cases.

It is therefore to large individual experience alone that we must appeal for conclusive evidence as to the value of intubation, not only as a means of saving life, but also as to its more important function as a means of euthanasia in the most excruciating of all forms of human suffering—that of slow strangulation.

There are at present a sufficient number of operators, both in this country and Europe, who possess this kind of experience, and they speak on this subject with no uncertain voice. Among the American intubationists who have had large individual experience and whose opinions on this question are well known I may mention Waxham, formerly of Chicago, now of Denver; Brown, Northrup, Huber, Caillé, Lester, Stanton, and the author, of New York; McNaughton, of Brooklyn; Hailes, of Albany; Eichberg, of Cincinnati; Richardson and Henrotin, of Chicago; Shimwell and Montgomery, of Philadelphia; Cheatham and Pusey, of Louisville; von Glahn, of Cleveland; Pyne, of Yonkers; and Graham, of Toronto. All of these and many others whose names I have not at hand have each had in the immediate neighborhood of or exceeding a hundred cases. Several of the operators mentioned can count their cases by hundreds, and four names could be selected whose aggregate number of cases now exceeds two thousand.

The latest intubation statistics are those by Dr. McNaughton and Dr. Maddern, of Brooklyn, who have collected from 242 operators in various parts of this country and Canada 5,546 cases, with 1,691 recoveries, or 30·5 per cent. (*Brooklyn Medical Journal*, August, 1893). Notwithstanding that it is only within the last three or four years that intubation has been adopted to any considerable extent in Europe, some valuable statistics have already been

accumulated. And these statistics are valuable not only because they are the result of large individual experiences, but also from the fact that they have been obtained exclusively from children's hospitals in which tracheotomy had hitherto been the only surgical measure available in the treatment of croup.

Professor Ranke, of Munich, as the result of a collective investigation on the subject of intubation in Germany, reports 1,324 cases of primary laryngeal diphtheria intubated, with 516 recoveries, and 121 cases secondary to measles, scarlet fever, pneumonia, etc., with 27 recoveries—a total of 1,445 cases, with 553 recoveries, or thirty-eight per cent. (*Münchener medicinische Wochenschrift*, No. 44, 1893). Of this number, Ganghofner, of Prague, contributed 498 cases, with 213 recoveries, 42·7 per cent.; Ranke, of Munich, 368 cases, with 128 recoveries, 34·7 per cent.; von Muvalt, of Zurich, 106 cases and 38 recoveries, 35·8 per cent.; Jaburowski, of Cracow, 165 cases and 73 recoveries, 44·2 per cent.; and Unterholzner, of Vienna, 164 cases and 55 recoveries, 35·5 per cent.

Secondary tracheotomy was resorted to in 250 of the cases, with only 20 recoveries, or about seven per cent.

In regard to the value of these statistics Ranke speaks as follows: "This number proves for itself that O'Dwyer's intubation, which at first and until lately was severely fought on all sides, has in the course of a few years gained more and more friends on this side of the Atlantic, and it proves that the dangers which were formerly charged against intubation must have been very greatly exaggerated."

And again, in giving the true explanation of the insignificant results obtained by means of secondary tracheotomy after intubation had failed, as follows: "The extraordinarily small percentage of recoveries from these secondary tracheotomies is explained in this way: that in the majority

of these cases secondary tracheotomy is resorted to after the diphtheritic process has extended to the bronchi, and that, under these circumstances, tracheotomy could not accomplish any more than intubation."

Similar testimony as to the value of this procedure comes from Hungary. Bokai, medical director of the Stefanie Children's Hospital of Budapest, has already intubated over 500 cases of croup, with recoveries of thirty-six per cent. In the medical report of the hospital for the year 1892, with an experience at that time of nearly 300 cases, Bokai, after referring to the necessity of having an additional diphtheria pavilion constructed, proceeds as follows: "That this construction was required was demonstrated by the fact that all the beds and extra rooms were continuously filled. The cause of this great attraction of our diphtheria division was due chiefly to the employment of intubation, and it gives us pleasure to be able to state that this procedure has given splendid results, so that tracheotomy has become almost wholly superfluous. In consequence of these splendid results, numerous friends have been added to the side of intubation, both in the country as well as in the city, and many colleagues have availed themselves of the rich material at our disposal to practice intubation under our direction. Convinced of the extraordinary importance of O'Dwyer's intubation in hospital as well as in private practice, I deemed it my duty to so instruct my colleagues, and it gives us pleasure to say that this acquisition has spread from our hospital throughout all Hungary."

Such is the evidence regarding the present status of intubation in Europe furnished by men whose reputations are more than national, and whose experience with this procedure has been amply sufficient to entitle them to speak on this subject with the voice of authority.

It will be noticed that the percentage of recoveries is considerably larger in Europe than is generally obtained in this country, and the same is also true of tracheotomy. The ready accessibility at all times of a skilled intubationist should give some better results in hospital than in private practice, which may in part explain the difference, as the statistics from the other side come exclusively from the hospitals, while in this country they are furnished, with few exceptions, from private practice. In 186 patients treated at the Willard Parker Hospital in New York, thirty-eight per cent. recovered, while at the Boston City Hospital 392 cases gave only twenty per cent.

In the former the resident physician and one trained assistant performed all the intubations, while in the latter they were done by successive house staffs, each member of which had charge of the diphtheria division in rotation. Under the latter circumstances the individual experience was necessarily small, so that no single operator could have had a sufficient amount of practice to enable him to avoid the accidents, not infrequently fatal, that are inseparable from intubation in the hands of the novice. That the different conditions which existed in these two hospitals explain the great discrepancy in the results I do not believe but that they were sufficient to produce a very considerable difference in the percentage of recoveries there is not the slightest room for doubt.

In regard to the comparative merits of intubation and tracheotomy as life-saving measures in the treatment of croup, I do not know of any stronger argument that could be produced in favor of the new procedure than a short quotation from a paper by Dr. L. S. Pilcher, of Brooklyn, during a discussion on this subject before the Kings County; Medical Society (*Brooklyn Medical Journal*, August, 1893).

Dr. Pilcher, while advocating the claims of tracheotomy

as the greater life-saving operation, makes the following very candid statement: "I believe that it has been my lot to be called upon to do tracheotomy for the relief of croup in a considerable proportion of the cases that have sought surgical relief, and yet during the seventeen years during which I have been operating I have been called upon to do the operation but 66 times, notwithstanding the deaths from croup in our city during this period amounted to between 400 and 500 every year. On the other hand, during the past four years Dr. McNaughton has been called upon to intubate 142 times. He has been instrumental in saving 42 lives in four years, I but 22 in seventeen years, notwithstanding 33·33 per cent. of my cases recovered and but 29·5 of his." In other words, Dr. Pilcher was doing tracheotomy on an average of four times in a year, when the deaths from croup during the same period amounted to between 400 and 500.

Estimating from the deaths as given above, the total number of croup cases that occurred in Brooklyn during the seventeen years referred to was somewhere between 8,000 and 9,000, and out of this vast number the most celebrated tracheotomist of that city succeeded in saving the lives of only 22. This is a good example of the life-saving qualities of tracheotomy, an operation which the poorer classes, among whom croup principally prevails, seldom consent to, and if they did the skilled nursing so essential to the proper after-treatment would not be available. Intubation, on the contrary, is rarely objected to by either the rich or the poor, the ignorant or the intelligent, and no skilled nursing is required, the one and only requisite being trained operators. Outside of hospital practice there is, therefore, no room for comparison between these two procedures, the question as to whether, in a given number of cases, one operation may save a small percentage more or less

than the other being one of scientific rather than of practical interest.

The difficulties and dangers of placing a tube in the larynx or removing it in the short space of time that is compatible with safety are either great or small according to the practical experience of the operator. When this important fact shall have been more generally recognized intubation will not be attempted by so many as heretofore, but will be left to those who have had some sort of preliminary training, if not on the cadaver, at least on a larynx, or on one of the smaller animals. By any of these means sufficient dexterity with the use of the instruments may be acquired to avoid at least some of the accidents inseparable from this operation in the hands of beginners.

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FRANK P. FOSTER, M.D.

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